

FLAVOBACTERIUM MENINGOSEPTICUM IN INTENSIVE CARE UNITS OF A TEACHING HOSPITAL IN RIYADH, SAUDI ARABIA

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Flavobacterium species are a group of gram-negative, aerobic, nonmotile, nonfermentative, oxidase-positive bacilli. They usually inhabit natural fresh and salt water as well as soil,^{1,2} but are not usually part of the human normal flora.³ *Flavobacterium meningosepticum* is the species most often associated with human disease, and it was initially recognized and named by King in 1959.⁴ Besides causing meningitis in premature infants,⁵⁻⁷ the organism has previously been reported as a cause of many hospital-acquired infections, including endocarditis,⁸ postoperative bacteremia,⁹ burn and soft tissue infections,¹⁰ as well as pneumonia in patients in intensive care units.^{11,12} Some of these infections were linked to environmental sources.^{10,13} *F. meningosepticum* isolates were known for their high level of resistance to antimicrobial agents usually used in the treatment of infections due to gram-negative aerobic bacilli.^{14,15} However, they are sometimes susceptible to antibiotics active against gram-positive organisms.¹⁵

In this study, we describe a limited outbreak of *F. meningosepticum* in the intensive care units of our hospital. The importance of different clinical features in the acquisition of *F. meningosepticum*, the possible sources, methods of transmission, and control of spread of this organism are also discussed. The aim of this study was to draw the attention of hospital staff in this country to the importance of this organism as a possible cause of hospital-acquired infection in intensive care units as well as to control measures for such outbreaks.

Patients and Methods

King Khalid University Hospital (KKUH) is the main teaching hospital in Riyadh, Saudi Arabia, with 650 beds. It provides primary, secondary and tertiary health care.

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Accepted for publication 25 March 1996. Received 11 November 1995.

The hospital has 63 critical care beds in six different intensive care units (ICUs), including a medical (MICU) and a coronary (CCU) care unit.

Both the MICU and CCU are located with the medical wards in the third floor of the hospital. The two units, adjacent to each other, are separated only by a single door, but are serviced by different staff members. The respiratory therapists serve both units. The two units' beds are always fully occupied, with 80% to 90% of the MICU patients usually on mechanical ventilation. The infection surveillance in the ICUs is conducted by the infection control officer and two infection control nurses.

The patients' data were collected from the medical files and the daily follow-up records of the MICU and CCU patients from whom *F. meningosepticum* was isolated during the period between 11/3/95 and 4/5/95.

From each patient, the following specimens were collected for culture: blood, sputum, endotracheal secretions, bronchoalveolar lavage, urine and feces. Throat, axillary, nasal, and perineal swabs were also collected from the patients and the health care members directly involved in their management, including the respiratory therapists. Fingerprints of all involved staff were also collected on relevant culture medium plates.

For environmental screening, specimens were collected from tap water, water sink traps and spigots, nebulizing fluids, nebulizing fluid dispensers, in-use disinfectant solutions, fluids used for cleaning respiratory equipment and soap containers. Specimens from dry objects, e.g., respiratory equipment, various fomites and trolley tops were collected by using premoistened swabs. High-level and low-level settled plates were also obtained. Similar specimens from matching patients, 32 staff members and environmental sites were collected from the general adult female medical ward during the same period as the controls.

All the specimens were cultured according to methods described before¹⁶ on blood agar, MacConkey and modified Thayer Martin media and incubated aerobically at 37°C for two to seven days. Suspicious-looking colonies were picked and identified by API 20 NE (analytical profile index, Biomerieux, France).